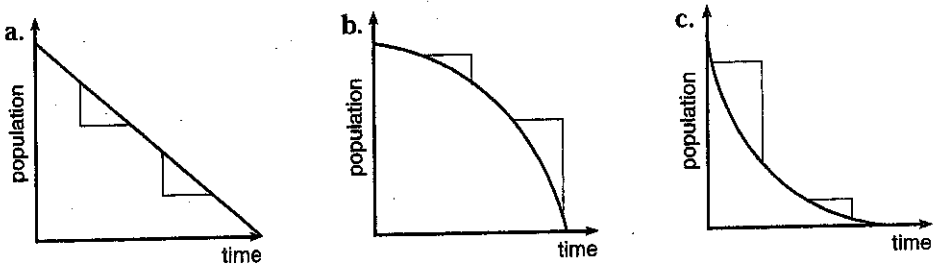
LESSON 1.7

The populations of Henterville, Kenterville, and Lenterville are decreasing. In each town at the end of every year, there are fewer people than there were at the beginning of the year.

- In Henterville, the population is decreasing at a constant rate. Every year, the population decreases by the same amount.
- In Kenterville, the rate of change is increasing. Every year, although the population continues to decrease, fewer and fewer people leave.
- In Lenterville, the rate of change is decreasing. Every year, the population is decreasing by a greater and greater amount.

Below are three graphs, each of which shows population decreasing as a function of time.



To help you decide which graph corresponds to each city, the graphs indicate two equal changes in time and the corresponding changes in population. In each case, time is passing as you move to the right along the horizontal axis. Compare the two changes in population that correspond to the two equal units of elapsed time.

1. Look carefully at graph **a**. Describe what you notice and determine which city's growth is shown.

2. Look carefully at graph **b**. Describe what you notice and determine which city's growth is shown.

3. Look carefully at graph **c**. Describe what you notice and determine which city's growth is shown.

4. Which graph shows a population that decreases relatively rapidly at first and then more slowly?

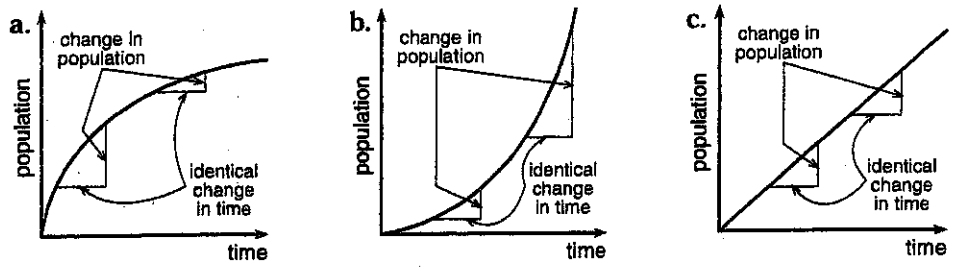
5. Which graph shows a population that decreases relatively slowly at first and then more rapidly?

Acceleration on a distance-time graph

The populations of Centerville, Denterville, and Fenterville are increasing. In each town at the end of every year, there are more people than there were at the beginning of the year.

- In Centerville, the population is increasing at a constant rate. Every year, the population increases by the same amount.
- In Denterville, the *rate* of increase is increasing. Every year, more and more people are moving to Denterville.
- In Fenterville, the rate of increase is decreasing. Every year, the population is increasing by a smaller and smaller amount.

Below are three graphs, each of which shows population increasing as a function of time.



To help you decide which graph corresponds to each city, the graphs indicate two equal changes in time and the corresponding changes in population. In each case, time is passing as you move to the right along the horizontal axis. Compare the two changes in population that correspond to the two equal units of elapsed time.

1. Look carefully at graph **a**. Describe what you notice and determine which city's growth is shown.
2. Look carefully at graph **b**. Describe what you notice and determine which city's growth is shown.
3. Look carefully at graph **c**. Describe what you notice and determine which city's growth is shown.

4. Janet, Gail, and Susan all walked away from the railroad station. Janet walked at a steady pace. Gail realized she was late and sped up as she walked. Susan slowed down to look around. Decide which graph shows each girl's walk.